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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
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ART UNIT	PAPER NUMBER
1644	12

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/844,544	Applicant(s) ZENG ET AL.	
	Examiner DiBrino Marianne	Art Unit 1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-8 and 10-14* is/are pending in the application.

4a) Of the above claim(s) *3,11 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2 ,6-8, 10 & 12-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicants response filed 6/6/03 (Paper No. 11) is acknowledged and has been entered.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his Invention.

3. Claims 1, 2, 6, 7, 8, 10, 12 and 13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for treating pathogenic polyclonal B cell activation or class switching in a patient, including when the said class switching results in SLE, comprising administering a CD1 blocking agent that is an antibody to CD1 or cocktail of antibodies that bind to multiple human CD1 isotypes which interfere(s) with T cell recognition of CD1 and is inhibitory of CD1 signaling, does not reasonably provide enablement for the treatment (or prophylaxis) of pathogenic polyclonal B cell activation or class switching in a patient using a CD1 blocking agent that is a fragment of an antibody which itself does not bind antigen. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

The specification does not disclose how to make and/or use the instant invention for the treatment (or prophylaxis) of the said activation/switching. The specification has not enabled the breadth of the claimed invention in view of the teachings of the specification because the claims encompass methods of treatment of polyclonal B cell activation or class switching using fragments of anti-CD1 antibodies which do not bind antigen. The state of the art is such that it is unpredictable in the absence of appropriate evidence whether the claimed agents can be used for treatment of polyclonal B cell activation or class switching in a patient, including when the class switching results in SLE, and including further administering a second therapeutic agent for treatment of SLE.

The specification discloses that CD1 blocking agents are molecules that interfere with the binding of CD1 by the TCR, for example by competitive or non-competitive binding to the extracellular domain of CD1, or to TCR that recognize CD1, and that the said agents do not activate CD1 signaling (paragraph spanning pages 8 and 9). The specification further discloses that CD1 blocking agents may be peptides, lipids, either alone or in combination with a peptide, soluble CD1, small organic molecules, peptidometics, soluble TCRs, antibodies or the like or fragments of antibodies (paragraphs 0034-0035 on page 9). The specification discloses other agents that can be used with CD1 blocking agents to relieve symptoms of SLE, i.e., NSAIDS, corticosteroids, Umuran, Cytoxan, methotrexate, cyclosporin, anticoagulants (paragraph 0059 on page 16). *The specification also discloses that "treatment" or "treating" is meant in the instant application to include "prophylaxis" (especially paragraphs 0060-0061 on page 17).* The specification discloses treatment of NZB/NZW mice with the anti-CD1 mAb produced by hybridoma 1B1 (anti-mouse CD1d) (page 21-end) and in vitro activation of B cells by cross-linking CD1 using the anti-CD1 mAb 3C11 (anti-rat CD1d) (page 20 at paragraph 0071).

The specification does not disclose using any blocking agent in vivo that is not the anti-CD1 mAb produced by hybridoma 1B1. The specification does not disclose use of this antibody with a second agent. The specification does not disclose working examples of therapy as prophylaxis. The specification does not disclose any examples of fragments of an anti-CD1 antibody that does not bind CD1 antigen, or use of the said antibody in the claimed method of treatment.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103 and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 2, 6, 7, 8, 10 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al (J. Immunol. 1998, 161: 1710-1717, IDS reference) in view of Kotzin (Cell, 1996, 85: 303-306, IDS reference), Zeng et al (J. Exp. Med. 1998, 187: 525-536), Blumberg et al (Immunol. Rev. 1995, 147: 5-29) and Hughes (Drug Disc. Today 3(10): 439-442, 1998).

Amano et al teach that the interaction between anti-CD1 T cells and B cells expressing surface CD1 leads to a mutual activation of both cell types that results in hypergammaglobulinemia and systemic autoimmunity in vivo via cross-linking of CD1 to secrete IgM and IgG. Amano et al further teach that transgenic CD1+ T cells (Vb9/Va4.4 T cell clone) induce lupus (SLE, an autoimmune disease) when transferred into nude host mice which do not spontaneously develop lupus and that spontaneous secretion of IgM and IgG by splenic B cells from lupus-prone NZB/NZW mice is mediated by CD1 hi subset of B cells (especially second to last paragraph of article). Amano et al teach that T cell proliferation of the said CD1-restricted T cell clone in response to CD1-transfected B cells could be blocked by use of the anti-CD1d mAb 3C11.

Amano et al do not teach the claimed method of treating pathogenic polyclonal B cell activation or class switching, including that resulting in lupus (SLE), in a patient, comprising administering a CD1 blocking agent that is an antibody, including a monoclonal antibody.

Kotzin teaches pathogenic IgG autoantibody production in SLE by clonal expansion of somatically mutated anti-DNA antibody-producing B cells (i.e., pathogenic polyclonal B cell activation), a process that mimics a normal T cell dependent response to foreign antigen, involving common mechanisms of affinity maturation, and IgM to IgG class switching (especially first paragraph on page 304). Kotzin

teaches that IgG autoantibodies to ds-DNA appear to play a prominent role in the immune complex glomerulonephritis of SLE (especially last paragraph on page 303).

Zeng et al teach T cells with transgenic TCR that recognized CD1 of syngeneic B cells induced lupus with anti-ds DNA autoantibodies, proteinuria and immune complex glomerulonephritis in nude mice that don't spontaneously develop lupus (especially abstract). Zeng et al teach anti-CD1 mAbs, including 3C11 (anti-CD1d) (especially materials and methods). Zeng et al teach that severity of disease is associated with the development of the anti-ds DNA autoantibodies and with elevated serum IgG2a as has been observed with hereditary lupus (especially page 534 at the second full paragraph in column 1).

Blumberg et al teach that CD1c is expressed on human B cells in peripheral blood, spleen and tonsil, that CD1a, b and c are expressed on activated monocytes (GM-CSF+/- IL-4), CD1a is expressed on Langerhans cells, CD1a, b and c are expressed on dendritic cells in the dermis and CD1d is expressed in the GI tract on epithelial cells in mice and in humans as well as in other tissues at low levels (especially pages 14 and 15). Blumberg et al teach antibodies to the CD1 molecules, including 3C11 (anti-CD1d) and antibodies to CD1a, b and c. Blumberg et al further teach that 3C11 blocks the interaction of T cells with CD1d (especially second paragraph on page 23).

Hughes teaches administration of monoclonal blocking antibodies (such as anti-TNFa), including humanized or human antibodies, to patients for a variety of conditions including autoimmune disease.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the anti-CD1d mAb taught by Zeng et al or Amano et al or the anti-CD1a, b, c and d antibodies taught by Blumberg et al to block CD1 recognition by Tcells as taught by Amano et al by administration of antibodies or humanized versions of the said antibodies to subjects with SLE as taught by Hughes for patients with autoimmune diseases.

One of ordinary skill in the art at the time the invention was made would have been motivated to do this to treat SLE because Amano et al teach that interaction of anti-CD1 T cells and CD1-expressing B cells leads to systemic autoimmunity seen in SLE via secretion of IgG and IgM antibodies, that transgenic T cells specific for CD1 can induce SLE and that T cell proliferation of the said T cells can be blocked by the use of an anti-CD1 mAb, Kotzin et al teach pathogenic polyclonal B cell activation and switching in SLE by anti-DNA antibody-producing B cells, Zeng et al teach that anti-CD1 TCR bearing T cells induce SLE and that the severity of disease is associated with the development of anti-DNA autoantibodies and elevated serum IgG2a (in mice), Zeng et al, Amano et al and Blumberg et al teach anti-CD1 mAbs, Blumberg et al further teach tissue distribution of CD1 isotypes on APC including B cells, and Hughes teaches administration of monoclonal blocking antibodies, including humanized antibodies to patients for a variety of conditions including autoimmune disease. Claim 12 is included in this rejection because the iv route of administration was well known in the art at the time the invention was made. Claim 8 is included in the instant rejection because the CD1d antibodies taught by Zeng et al or Amano et al would be expected to bind to human CD1d since CD1d of mice or rat would be expected to cross-react with human CD1d due to the high degree of homology between mouse, rat and human CD1d and as taught by Blumberg et al. Alternately, the value of monoclonal antibodies to proteins was well known in the art at the time the invention was made, in terms of specificity, purity and yield and Blumberg et al teach the human CD1d protein. A routineer would have used the same basic technique for producing monoclonal antagonist antibodies against human CD1d protein by using an appropriate in vitro assay where antagonistic antibodies could be detected.

Applicant's arguments in the amendment filed 6/6/03 have been fully considered, but are not persuasive.

It is Applicant's position that Applicant has provided in vivo evidence that blocking CD1 by administration of antibodies significantly reduced the peak levels of serum IgG and IgG anti-dsDNA autoantibodies and delayed disease progression in an animal model of spontaneous disease, vs the prior art model which required transfer of cells, and that human lupus occurs spontaneously. It is Applicant's further position that that without findings provided in the instant application, one of skill in the art could not have a reasonable certainty of success practicing the claimed methods. Applicant's arguments concerning Amano et al and Zeng et al are of record on pages 7 and 8 of the said amendment that one of skill in the art would not conclude with any degree of certainty that CD1 would have a causative effect in lupus. Applicant argues the remainder of the references separately.

It is the Examiner's position that Applicant used NZB/NZW mouse model of lupus and that Amano et al teach "More recent studies have shown that the spontaneous secretion in vitro of both IgM and IgG by spleen cells from lupus-prone New Zealand Black/New Zealand White [i.e., NZB/NZW] mice is mediated by the CD1 high subset of B cells, i.e., that spontaneous antibody secretion in the same disease model used by Applicant is mediated by $CD1^+$ B cells.

In response to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See in re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

6. Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al (J. Immunol. 1998, 161: 1710-1717, IDS reference) in view of Kotzin (Cell, 1996, 85: 303-306, IDS reference), Zeng et al (J. Exp. Med. 1998, 187: 525-536), Blumberg et al (Immunol. Rev. 1995, 147: 5-29) and Hughes (Drug Disc. Today 3(10): 439-442, 1998) as applied to claims 1, 2, 6, 7, 8, 10 and 12 above, and further in view of the Merck Manual (pages 1317-1321, 16th Edition, 1992).

The combination of Amano et al , Kotzin, Zeng et al, Blumberg et al and Hughes has been discussed supra, "the combined references".

The said combination does not teach the claimed method of treatment of activation/class switching that results in SLE, further comprising administration of a second therapeutic agent for the treatment of SLE.

The Merck Manual teaches treatment of SLE with corticosteroid treatment, such as with prednisone, in combination with immunosuppressive agents.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have treated with the method of the combined references, i.e., administration of an immunosuppressive agent, an antibody to CD1 that blocks binding of the TCR, and further comprising treatment with the corticosteroid taught by the Merck Manual for treatment of SLE.

One of ordinary skill in the art at the time the invention was made would have been motivated to do this in order to treat SLE as taught by the combined references and by the Merck Manual. The motivation to combine can arise from the expectation that the prior art elements will perform their expected

functions to achieve their expected results when combined for their common known purpose. Section MPEP 2144.07.

Applicant's arguments in the amendment filed 6/6/03 have been fully considered, but are not persuasive.

Applicant's arguments are of record in the said amendment on page 9 at the second to the last paragraph, and the Examiner's arguments supra apply herein.

7. The reference "AB" crossed out in the Form 1449 filed 8/20/01 has not been considered because it can't be located. It will be considered in the next Office Action. It would expedite prosecution if Applicant would send in copies of references. It is noted that Applicant has provided a copy of Brossay et al rather than Bending et al.

8. No claim is allowed.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne DiBrino whose telephone number is 703-308-0061. The examiner can normally be reached on Monday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan, can be reached on (703) 308-3973. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Marianne DiBrino, Ph.D.
Patent Examiner
Group 1640
Technology Center 1600
October 20, 2003

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